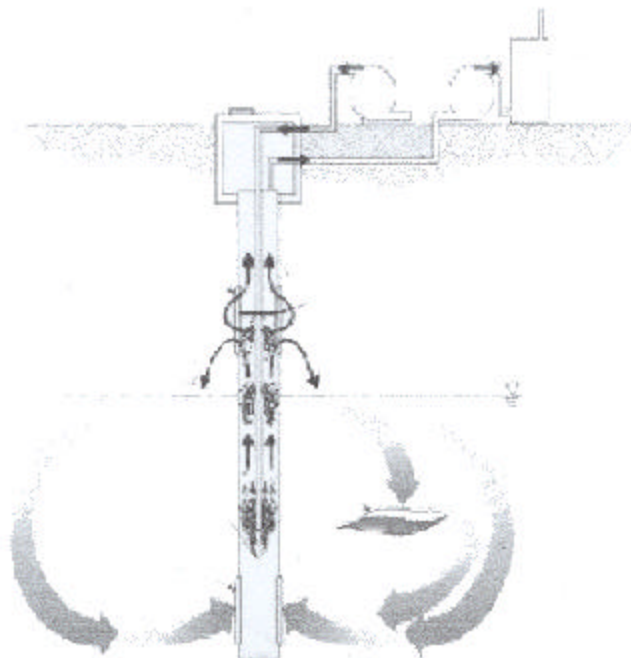


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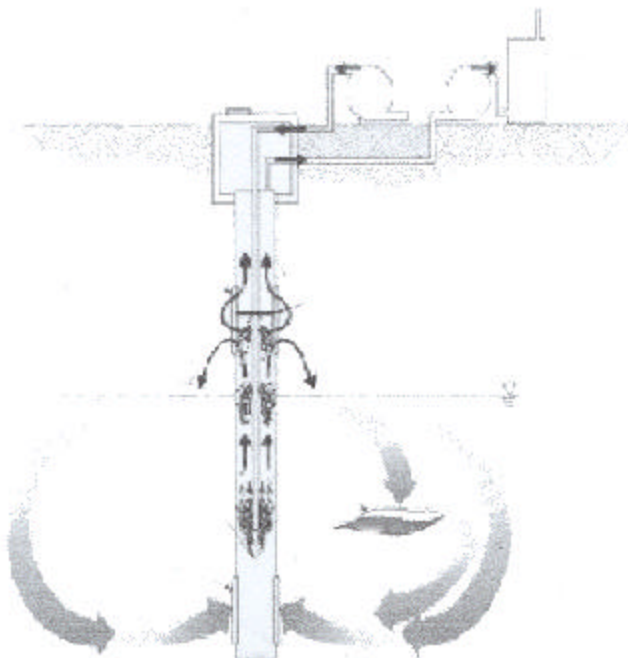
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TABLE A1

DAILY OPERATION SUMMARY
NoVOCS™ SITE Demonstration
Site 9, NAS North Island, California

Operation Period								
Startup/Shakedown		Early System Operation						
Date	Hours	Date	Hours	Date	Hour	Date	Hour	
2/26/98	5.5	4/20/98	9	5/8/98	7	6/4/98	24	
3/5/98	7.5	4/21/98	22	5/9/98	10.5	6/5/98	24	
3/6/98	1	4/22/98	22.5	5/11/98	12	6/6/98	24	
3/9/98	5	4/23/98	24	5/12/98	12	6/7/98	24	
3/13/98	9	4/24/98	24	5/13/98	12	6/8/98	24	
3/14/98	23	4/25/98	24	5/16/98	7	6/9/98	24	
3/15/98	24	4/26/98	24	5/17/98	24	6/10/98	18	
3/16/98	17	4/27/98	24	5/18/98	24	6/11/98	8	
3/17/98	24	4/28/98	24	5/19/98	24	6/12/98	24	
3/18/98	23	4/29/98	24	5/20/98	24	6/13/98	24	
3/19/98	24	4/30/98	24	5/21/98	24	6/14/98	24	
3/20/98	8	5/1/98	24	5/22/98	24	6/15/98	24	
3/21/98	24	5/2/98	24	5/23/98	23	6/16/98	24	
3/22/98	24	5/3/98	24	5/24/98	24	6/17/98	24	
3/23/98	24	5/4/98	8	5/25/98	24	6/18/98	24	
3/24/98	24	5/5/98	24	5/26/98	10	6/19/98	20	
3/25/98	24	5/6/98	24	6/1/98	7	-	-	
3/26/98	15	5/7/98	24	6/3/98	10	-	-	
Total	306	Total						1,056

Note:

Dates in bold indicate a weekly or monthly sampling event was conducted.

TABLE A1 (Continued)

DAILY OPERATION SUMMARY
NoVOCS™ SITE Demonstration
Site 9, NAS North Island, California

Operation Period							
Reconfiguration Operation				Final Operation			
Date	Hours	Date	Hours	Date	Hour	Date	Hour
9/24/98	24	10/17/98	7	12/4/98	7	12/22/98	24
9/25/98	24	10/19/98	11	12/5/98	18	12/23/98	24
9/26/98	12	10/20/98	13	12/6/98	24	12/24/98	21
9/29/98	1.5	10/21/98	24	12/7/98	11	12/25/98	24
9/30/98	14.5	10/22/98	24	12/8/98	0	12/26/98	22
10/1/98	21.5	10/23/98	24	12/9/98	5	12/27/98	24
10/2/98	22	10/24/98	24	12/10/98	21	12/28/98	23
10/6/98	12	10/25/98	24	12/11/98	24	12/29/98	16
10/7/98	12	10/26/98	22	12/12/98	24	12/30/98	8
10/8/98	12	10/27/98	11	12/13/98	24	12/31/98	22
10/09/98	24	10/28/98	8	12/14/98	24	1/1/99	24
10/10/98	24	10/29/98	9	12/15/98	24	1/2/99	24
10/11/98	10	-	-	12/16/98	24	1/3/99	19
10/12/98	12	-	-	12/17/98	24	1/4/99	10
10/13/98	24	-	-	12/18/98	24	-	-
10/14/98	12	-	-	12/19/98	24	-	-
10/15/98	5	-	-	12/20/98	24	-	-
10/16/98	15	-	-	12/21/98	24	-	-
Total			506.5	Total			635

TABLE A2

**OPERATION AND MAINTENANCE SUMMARY
NOVOCs™ SITE Demonstration
Site 9, NAS North Island, California**

DATE	DESCRIPTION
02/26/98 through 03/09/98	Startup of the NoVOCs™ system was initiated on February 26, 1998. The NoVOCs™ system underwent startup and shakedown activities through March 9, 1998.
03/13/98 through 03/25/98	The NoVOCs™ system operated continuously with only minor shutdowns for system checks and balances.
03/26/98	The NoVOCs™ system was shut down at 1500 because of lack of pH control.
04/20/98	The NoVOCs™ system was restarted; the pH meter was connected to the remote control panel.
05/04/98 through 05/13/98	The NoVOCs™ system operated continuously with periodic system shutdowns because of high water levels in the well.
05/14/98 through 05/15/98	The NoVOCs™ system was shut down to conduct system maintenance. The well components were removed from the well, and the upper and lower screens were redeveloped. Iron hydroxide precipitation was observed on the well screens and internal well components.
05/16/98	The NoVOCs™ system was restarted.
05/26/98	The NoVOCs™ system was shut down at 1030 because of failure of the pH pre-amplifier.
06/01/98	The pH pre-amplifier was repaired and the NoVOCs™ system was restarted; however, the NoVOCs™ system was later shut down because of low pH readings measured in the well.
06/03/98	The NoVOCs™ system was restarted at 1330 using reduced acid injection settings. The pH was initially around 7.0 and had stabilized at 7.5 at the end of the day. Water flow readings measured using a Magnehelic needle gauge at the wellhead indicated that water flow within the wells was about 1 to 3 gpm.
06/10/98	The NoVOCs™ system was shut down briefly to increase the depth of the air diffuser from 9.5 to 10.5 feet below the water table and to slightly increase the acid injection rate at the well. The NoVOCs™ system was shut down automatically at 1856 because of high water levels in the well.

TABLE A2 (Continued)

OPERATION AND MAINTENANCE SUMMARY
NOVOCs™ SITE Demonstration
Site 9, NAS North Island, California

DATE	DESCRIPTION
06/11/98	The submergence of the air diffuser was set back to 9.5 feet below the water table and the NOVOCs™ system was restarted at 1557.
06/19/98	The NOVOCs™ system was shut down at 1926 because of high water levels in the well. The NOVOCs™ system was restarted remotely at 2006 and ran for 3 minutes before it was shut down again because of high water level.
06/22/98	An attempt to restart the NOVOCs™ system remotely was made at 0912; however, the NOVOCs™ system experienced an immediate shutdown because the Thermatrix system was down. The Thermatrix system was checked; however, no problems were identified.
06/24/98	Additional efforts to restart the Thermatrix system were unsuccessful. The valve on the Thermatrix skid that opens to accept vapors from the NOVOCs™ system was not opening when attempts to restart the system were made.
08/27/98	Installation of the redesigned NOVOCs™ system was complete.
09/24/98	The redesigned NOVOCs™ system began operation.
09/26/98	The NOVOCs™ system was shut down because of a low volume of acid in the storage tank. The acid tank was switched out and the NOVOCs™ system was restarted at 0830. The NOVOCs™ system was shut down again at 2000 because the Thermatrix system was not operating properly.
09/29/98	The NOVOCs™ and Thermatrix systems were restarted at 2000. The NOVOCs™ system was shut down at 2100 because of a high blower temperature.
09/30/98	The NOVOCs™ system was restarted.
10/03/98 through 10/05/98	NOVOCs™ system was shut down because of high water levels in the well.
10/06/98 through 10/07/98	The submergence of the air diffuser line was increased by about 2 feet and the NOVOCs™ system was restarted. The NOVOCs™ system was shut down because of high water levels in the well.
10/08/98	The NOVOCs™ system was restarted at about 1200 on October 8, 1998. Water levels in the shallow piezometer showed a progressive increase from 3.5 feet bgs on October 8, 1998, to ground surface on October 11, 1998.
10/11/98	The NOVOCs™ system was shut down because of high water levels in the well. When the NOVOCs™ system was restarted, the Thermatrix system shut down because pH levels were outside of control limits.

TABLE A2 (Continued)

OPERATION AND MAINTENANCE SUMMARY
NOVOCs™ SITE Demonstration
Site 9, NAS North Island, California

DATE	DESCRIPTION
10/12/98	The Thermatrix system was inspected by the developer. The NOVOCs™ and Thermatrix systems were restarted at 1130.
10/13/98	The NOVOCs™ system was shut down at 1500 because of low quench levels in the Thermatrix system.
10/14/98	The Thermatrix system was repaired and the NOVOCs™ system was restarted. The water level in the return piezometer was observed about 6 inches above the top of the piezometer, indicating a pumping rate of about 22 to 25 gpm.
10/15/98	The NOVOCs™ system was shut down because the municipal water supply to the Thermatrix system had been turned off.
10/16/98	The water supply to the Thermatrix system was reestablished and the NOVOCs™ and Thermatrix systems were restarted.
10/18/98	The NOVOCs™ system was shut down because of high water levels in the well.
10/19/98	The NOVOCs™ system was restarted at 1030. Numerous high-level water alarms were reported throughout the day. The NOVOCs™ system was shut down at 1430 to raise the air diffuser about 1.5 feet. The NOVOCs™ system was restarted at 1500.
10/20/98	The NOVOCs™ system was shut down because of high water levels in the well. The high water-level float switch was removed from the interior of the NOVOCs™ well. A 2-inch-diameter PVC pipe was adapted onto the 0.5-inch-diameter return piezometer. The float switch was placed in the 2-inch-diameter PVC pipe at a height of about 3 feet above grade. During this modification a steady stream of water was observed leaving the NOVOCs™ wellhead through the airline that takes VOC-laden vapors to the Thermatrix system. The air injection rate was left at 63 scfm. The NOVOCs™ system was restarted and the air injection rate was slowly reduced until the water level in the return piezometer was just above the ground surface.
10/21/98	Occasional slugs of water were observed leaving the airline that takes VOC-laden vapors to the Thermatrix system. The water level in the return piezometer was visually observed near the float switch height (about 3 feet above grade). The air injection rate was once again lowered until the water level in the return piezometer was just below the ground surface. The flow of water out of the airline stopped after the air injection rate was reduced.
10/22/98	The Thermatrix system was shut down at 1415 because the water injection jets to the scrubber tower were partially clogged. The water jets were repaired and the NOVOCs™ and Thermatrix systems were restarted at 1615.

TABLE A2 (Continued)

OPERATION AND MAINTENANCE SUMMARY
NOVOCs™ SITE Demonstration
Site 9, NAS North Island, California

DATE	DESCRIPTION
10/27/98	The NoVOCs™ system was shut down at 0940 because of rising water levels in the well. The pH eductor pipe was removed for inspection. A slimy light orange stain was present over almost the entire length of the pipe, suggesting that iron fouling occurred, causing a reduction of water flow back into the formational sands.
10/28/98	The NoVOCs™ system was restarted.
10/29/98	The NoVOCs™ system was shut down at 0800. A bromide/chloride solution was injected in the well. The NoVOCs™ system was restarted to conduct system observations and inspection. The NoVOCs™ system was shut down at 1700.
10/30/98	The NoVOCs™ system was operated briefly and was shut down because of high water levels in the well.
11/30/98 through 12/04/98	Internal well components were removed for inspection and maintenance. The NoVOCs™ system was restarted after reinstallation of the internal components on December 4, 1998. During operation, about 5 gallons of hydrochloric acid were injected into the well, which lowered the pH to 1 to 2 in the well.
12/05/98	The NoVOCs™ system was shut down from 1100 to 1600 to make repairs on the Thermatrix system. Citric acid and minor amounts of hydrochloric acid were injected into the well to maintained the pH level at 4 to 6.
12/07/98	The NoVOCs™ system was shut down at 1100 because of problems with ignition of the Thermatrix system pilot flame.
12/09/98	The Thermatrix system was repaired and the NoVOCs™ system restarted at 1900.
12/10/98	The Thermatrix system was shut down for maintenance by the developer. The NoVOCs™ and Thermatrix systems were restarted at 1630.
12/11/98	The NoVOCs™ system was shut down briefly during the day to check remote system controls.
12/17/98 through 12/23/98	The pH was lowered three times using hydrochloric acid, for a total of 10 hours of run time at a pH of 1.5. This was done to see if the lowered pH would help lower the water level in the recharge piezometer by removing potential iron precipitation (this did not reduce the water level in the return piezometer). About 35 gallons of the bromine/chlorine solution was added to the intake piezometer on December 22, 1998.
12/24/98	The NoVOCs™ system was shut down at 0200 because the Thermatrix system went off line. Thermatrix system was repaired and both systems were restarted at 0615.
12/26/98	The NoVOCs™ system was shut down at 1600 because of high pH levels at the well. Batteries for pH pre-amplifier were replaced and the NoVOCs™ system was restarted.

TABLE A2 (Continued)

**OPERATION AND MAINTENANCE SUMMARY
NOVOCs™ SITE Demonstration
Site 9, NAS North Island, California**

DATE	DESCRIPTION
12/29/98	The NoVOCs™ system was shut down at 1630 because of high water levels in the well. Water was also observed exiting the wellhead through the interior of the airline leading to the Thermatrix system.
12/30/98	<p>The water trapped in the airlines was blown out using the NoVOCs™ blower. About 5 gallons of water was removed from the airline system. In addition, water samples were collected from the upper recharge screen. White biological material was pumped from the recharge screen, which likely plugged the screen and caused the observed high water levels in the well.</p> <p>In an attempt to mitigate biofouling of the well screen, a bromide/chloride solution and hydrogen peroxide were added to the well. About 4 gallons of 3 percent hydrogen peroxide solution and 5 gallons of 35 percent solution were used. About 10 gallons of the bromide/chloride solution was added to the well. The solutions were added to the annulus of the well, recharge piezometer, and intake piezometer. After the injections, the NoVOCs™ system was restarted at 1615 and was able to maintain a pumping rate of 10 gpm.</p>
01/03/98	The NoVOCs™ system was shut down at 1200 because the Thermatrix system went off line. The NoVOCs™ and Thermatrix systems were restarted at 1700.
01/04/99	The NoVOCs™ system was shut down because of high water levels in the well. The high water level shutdown was accompanied by a small increase in water level in the shallow piezometer. This information appeared to suggest that biofouling of the recharge screen had occurred again. Based on this information, the Navy decided to terminate the demonstration.

TABLE A3

FIELD PARAMETER SUMMARY - CONDUCTIVITY
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Conductivity (Fmhos/cm x 10 ³)							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	34.5	37.6	50.0	*	45.5	45.5	33.8
PZ-02	Influent System Well	NA	35.2	38.8	50.3	*	50.3	33.5	44.8
MW-45	Shallow Well	17.4	19.9	NA	NA	NA	26.6	21.0	25.8
MW-46	Intermediate Well	14.4	30.3	NA	NA	NA	42.9	31.9	43.2
MW-47	Deep Well	18.3	36.4	NA	NA	NA	45.9	34.1	46.5
MW-48	Shallow Well	22.7	29.4	NA	NA	NA	38.5	29.5	38.7
MW-49	Deep Well	23.9	34.0	NA	NA	NA	41.8	30.8	43.8
MW-50	Intermediate Well	25.2	31.2	NA	NA	NA	35.2	29.2	41.9
MW-51	Intermediate Well	25.3	31.5	NA	NA	NA	44.6	29.8	41.5
MW-52	Shallow Well	20.1	23.2	NA	NA	NA	35.1	35.2	32.3
MW-53	Deep Well	25.7	NA ⁽¹⁾	NA	NA	NA	51.9	NA	47.3
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	28.2	NA	40.8

Notes:

Fmhos/cm

Micromhos per centimeter

NA

Not analyzed

*

The data were collected; however, due to severe weather conditions (high winds), the data were lost and could not be recovered.

(1)

Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

(2)

Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A4

FIELD PARAMETER SUMMARY - DISSOLVED OXYGEN
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Dissolved Oxygen (mg/L)							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	10.31	9.10	9.44	*	7.02	7	8.97
PZ-02	Influent System Well	NA	9.75	8.66	9.96	*	9.05	6.25	8.93
MW-45	Shallow Well	1.5	9.90	NA	NA	NA	9.43	5.5	9.72
MW-46	Intermediate Well	2.0	10.50	NA	NA	NA	9.98	6.7	9.98
MW-47	Deep Well	3.0	9.61	NA	NA	NA	10.3	4.76	9.01
MW-48	Shallow Well	2.25	10.10	NA	NA	NA	10.2	3.85	9.25
MW-49	Deep Well	5.0	9.66	NA	NA	NA	9.21	2.75	8.77
MW-50	Intermediate Well	1.75	9.91	NA	NA	NA	9.48	2.8	9.04
MW-51	Intermediate Well	1.25	8.28	NA	NA	NA	8.97	3.8	8.88
MW-52	Shallow Well	2.8	10.01	NA	NA	NA	9.97	10.09	9.61
MW-53	Deep Well	2.25	NA ⁽¹⁾	NA	NA	NA	10.1	NA	9.60
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	9.57	NA	8.79

Notes:

mg/L Milligrams per liter

NA Not analyzed

* The data were collected; however, due to severe weather conditions (high winds), the data were lost and could not be recovered.

(1) Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

(2) Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A5

FIELD PARAMETER SUMMARY - pH
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	pH							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	7.36	7.14	8.26	*	7.17	7.44	7.26
PZ-02	Influent System Well	NA	7.53	6.71	7.25	*	7.01	6.88	7.17
MW-45	Shallow Well	7.17	8.13	NA	NA	NA	7.35	7.37	7.44
MW-46	Intermediate Well	7.10	7.72	NA	NA	NA	7.28	7.2	7.15
MW-47	Deep Well	6.71	7.52	NA	NA	NA	6.95	6.95	6.83
MW-48	Shallow Well	7.29	7.92	NA	NA	NA	7.14	7.15	7.12
MW-49	Deep Well	7.38	8.13	NA	NA	NA	7.11	7.26	7.26
MW-50	Intermediate Well	7.32	7.77	NA	NA	NA	7.21	7.22	7.16
MW-51	Intermediate Well	7.20	7.53	NA	NA	NA	7.15	7.11	7.08
MW-52	Shallow Well	7.54	8.24	NA	NA	NA	7.44	7.45	7.39
MW-53	Deep Well	6.84	NA ⁽¹⁾	NA	NA	NA	6.85	NA	6.69
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	7.13	NA	6.88

Notes:

NA Not analyzed

* The data were collected; however, due to severe weather conditions (high winds), the data were lost and could not be recovered.

(1) Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

(2) Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A6

**FIELD PARAMETER SUMMARY - REDUCTION/OXIDATION POTENTIAL
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California**

Well	Description	Reduction/Oxidation Potential (mV)							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	NA	NA	NA	NA	NA	105	120
PZ-02	Influent System Well	NA	NA	NA	NA	NA	NA	97	150
MW-45	Shallow Well	125	NA	NA	NA	NA	NA	95	157
MW-46	Intermediate Well	115	NA	NA	NA	NA	NA	111	151
MW-47	Deep Well	74	NA	NA	NA	NA	NA	87	126
MW-48	Shallow Well	9	NA	NA	NA	NA	NA	90	165
MW-49	Deep Well	-77	NA	NA	NA	NA	NA	4	136
MW-50	Intermediate Well	91	NA	NA	NA	NA	NA	-0.007	122
MW-51	Intermediate Well	81	NA	NA	NA	NA	NA	96	135
MW-52	Shallow Well	65	NA	NA	NA	NA	NA	NA	147
MW-53	Deep Well	22	NA ⁽¹⁾	NA	NA	NA	NA	NA	156
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	NA	NA	140

Notes:

mV Millivolts

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A7

FIELD PARAMETER SUMMARY - SALINITY
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Salinity (percent)							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8/-1598	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	2.19	2.38	3.28	*	2.95	NA	2.13
PZ-02	Influent System Well	NA	2.22	2.47	3.31	*	3.05	NA	2.90
MW-45	Shallow Well	NA	1.19	NA	NA	NA	1.64	NA	1.58
MW-46	Intermediate Well	NA	1.89	NA	NA	NA	2.82	NA	2.80
MW-47	Deep Well	NA	2.31	NA	NA	NA	2.99	NA	3.03
MW-48	Shallow Well	NA	1.82	NA	NA	NA	2.46	NA	2.47
MW-49	Deep Well	NA	2.14	NA	NA	NA	2.71	NA	2.84
MW-50	Intermediate Well	NA	1.96	NA	NA	NA	2.27	NA	2.70
MW-51	Intermediate Well	NA	1.96	NA	NA	NA	2.93	NA	2.67
MW-52	Shallow Well	NA	1.41	NA	NA	NA	2.23	NA	2.03
MW-53	Deep Well	NA	NA ⁽¹⁾	NA	NA	NA	3.44	NA	3.08
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	1.74	NA	2.60

Notes:

NA Not analyzed

* The data were collected; however, due to severe weather conditions (high winds), the data were lost and could not be recovered.

(1) Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

(2) Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A8

FIELD PARAMETER SUMMARY - TEMPERATURE
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Temperature (EC)							
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Tetra Tech Week 1 4/28/98	Tetra Tech Week 2 5/6/98	Tetra Tech Week 3 5/12/98	Tetra Tech 1st Monthly 6/8-10/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	21.4	19.3	21.0	*	19.0	19.0	21.2
PZ-02	Influent System Well	NA	20.4	20.3	21.2	*	19.8	20.7	21.8
MW-45	Shallow Well	18.1	20.7	NA	NA	NA	20.3	20.7	22.3
MW-46	Intermediate Well	19.2	20.8	NA	NA	NA	21.1	21.0	21.6
MW-47	Deep Well	18.1	21.0	NA	NA	NA	21.3	21.5	21.6
MW-48	Shallow Well	19.8	21.1	NA	NA	NA	21.6	21.8	21.2
MW-49	Deep Well	20.2	20.6	NA	NA	NA	20.6	22.0	21.9
MW-50	Intermediate Well	21.3	21.0	NA	NA	NA	21.1	21.7	21.5
MW-51	Intermediate Well	20.7	20.8	NA	NA	NA	21.5	22.1	21.5
MW-52	Shallow Well	20.6	20.7	NA	NA	NA	21.1	21.0	20.9
MW-53	Deep Well	18.5	NA ⁽¹⁾	NA	NA	NA	20.4	NA	20.8
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	NA	NA	20.9	NA	21.6

Notes:

NA Not analyzed

* The data were collected; however, due to severe weather conditions (high winds), the data were lost and could not be recovered.

(1) Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

(2) Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A9

GEOCHEMICAL SUMMARY - ALKALINITY
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Alkalinity (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	380	NA	270
PZ-02	Influent System Well	NA	140	NA	280
MW-45	Shallow Well	638	710	736	820
MW-46	Intermediate Well	314	230	252	280
MW-47	Deep Well	417	430	338	390
MW-48	Shallow Well	304	330	344	330
MW-49	Deep Well	293	320	313	320
MW-50	Intermediate Well	281	310	296	310
MW-51	Intermediate Well	269	140	302	320
MW-52	Shallow Well	320	160	358	370
MW-53	Deep Well	451	NA ⁽¹⁾	358	440
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	520

Notes:

mg/L Milligrams per liter

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A10

GEOCHEMICAL SUMMARY - TOTAL DISSOLVED SOLIDS
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Total Dissolved Solids (mg/L x 10 ³)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	35.0	NA	29.0
PZ-02	Influent System Well	NA	35.0	NA	37.0
MW-45	Shallow Well	17.6	18.0	17.2	10.0
MW-46	Intermediate Well	27.3	30.0	28.4	41.0
MW-47	Deep Well	32.0	35.0	31.1	35.0
MW-48	Shallow Well	25.7	26.0	25.3	31.0
MW-49	Deep Well	29.2	31.0	28.6	31.0
MW-50	Intermediate Well	27.3	31.0	28.4	38.0
MW-51	Intermediate Well	27.0	31.0	27.6	38.0
MW-52	Shallow Well	22.7	24.0	21.4	31.0
MW-53	Deep Well	31.0	NA ⁽¹⁾	21.4	38.0
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	40.0

Notes:

mg/L Milligrams per liter

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A11

GEOCHEMICAL SUMMARY
TOTAL ORGANIC CARBON AND DISSOLVED ORGANIC CARBON
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	TOC (mg/L)		DOC (mg/L)	
		Bechtel Baseline 2/6-12/98	Bechtel 6/8-15/98	Tetra Tech Baseline 4/17/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	NA	1	2
PZ-02	Influent System Well	NA	NA	1	2
MW-45	Shallow Well	16.1	18.2	12	14
MW-46	Intermediate Well	5.5	3.4	2	2
MW-47	Deep Well	3.4	3.0	2	2
MW-48	Shallow Well	7.8	5.9	3	4
MW-49	Deep Well	4.3	4.8	2	3
MW-50	Intermediate Well	5.3	5.8	2	3
MW-51	Intermediate Well	4.6	4.6	2	3
MW-52	Shallow Well	6.2	6.5	2	*
MW-53	Deep Well	3.1	6.5	NA ⁽¹⁾	2
MW-54	Fully Penetrating Well	NA	NA	NA ⁽²⁾	9

Notes:

mg/L Milligrams per liter

TOC Total organic carbon

DOC Dissolved organic carbon

NA Not analyzed

* Analytical results for DOC were not available because the sample container was broken during transport.

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A12

SEMIVOLATILE ORGANIC COMPOUND SUMMARY — 1,2-DICHLOROBENZENE
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	1,2-Dichlorobenzene (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<10	NA	<310
PZ-02	Influent System Well	NA	<10	NA	<310
MW-45	Shallow Well	82	26	20 J	<500
MW-46	Intermediate Well	74	22	6 J	<150
MW-47	Deep Well	30 J	23	<250	<330
MW-48	Shallow Well	200 D	150	300	<10
MW-49	Deep Well	<0.7	<10	<10	210
MW-50	Intermediate Well	3 J	3.2 J	5 J	<50
MW-51	Intermediate Well	9.9	12	26	<150
MW-52	Shallow Well	52 D	58	110	73 J
MW-53	Deep Well	40 JD	NA ⁽¹⁾	<250	73 J
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<3,300

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

D Laboratory qualifier identifies compounds in an analysis at a secondary dilution factor

J Laboratory qualifier indicates that the associated numerical value is an estimate

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A13

METALS SUMMARY - ALUMINUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Aluminum (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	230	NA	<200
PZ-02	Influent System Well	NA	<200	NA	<200
MW-45	Shallow Well	35.4 B	<200	29.6 B	<200
MW-46	Intermediate Well	43.5 B	<200	18.8 B	<200
MW-47	Deep Well	37.5 B	<200	25.1 B	<200
MW-48	Shallow Well	17.4 B	<200	24.8 B	<200
MW-49	Deep Well	13.9 B	<200	24.4 B	<200
MW-50	Intermediate Well	17.6 B	235	50.7 B	<200
MW-51	Intermediate Well	20.0 B	<200	27.6 B	<200
MW-52	Shallow Well	19.6 B	<200	17.7 B	<200
MW-53	Deep Well	35.5 B	NA ⁽¹⁾	17.7 B	<200
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<200

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the IDL, but greater than or equal to CRDL

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A14

METALS SUMMARY - ANTIMONY
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Antimony (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	68	NA	<60
PZ-02	Influent System Well	NA	<60	NA	<60
MW-45	Shallow Well	29.1 B	<60	31.7 B	<60
MW-46	Intermediate Well	38.7 B	<60	17.9 B	<60
MW-47	Deep Well	30.4 B	<60	35.8 B	<60
MW-48	Shallow Well	22.2 B	<60	33.4 B	<60
MW-49	Deep Well	29.4 B	<60	35.0 B	65.9
MW-50	Intermediate Well	19.0 B	<60	32.6 B	62.6
MW-51	Intermediate Well	17.2 B	<60	18.8 B	80.8
MW-52	Shallow Well	21.7 B	<60	38.4 B	<60
MW-53	Deep Well	26.9 B	NA ⁽¹⁾	38.4 B	65.3
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<60

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A15

METALS SUMMARY - ARSENIC
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Arsenic (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<100	NA	<200
PZ-02	Influent System Well	NA	<100	NA	<200
MW-45	Shallow Well	2.8 BWN	<100	3.6 BWN	<200
MW-46	Intermediate Well	3.6 BWN	<100	1.8 BWN	<200
MW-47	Deep Well	37.0 SN	<100	30.6 SN	<200
MW-48	Shallow Well	1 UWN	<100	2.6 BWN	<200
MW-49	Deep Well	1 UWN	<100	1.9 BWN	<200
MW-50	Intermediate Well	3.8 BWN	<100	2.5 BWN	<200
MW-51	Intermediate Well	2.0 BWN	<100	2.0 BWN	<200
MW-52	Shallow Well	1.6 BWN	<100	2.0 BWN	<200
MW-53	Deep Well	42.5 SN	NA ⁽¹⁾	2.0 BWN	<200
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<200

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

BWN Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, post digestion spike and spiked sample recovery not within control limits

SN Reported value determined by Method of Standard additions and spiked sample recovery not within control limits

UWN Concentration below detection limit (detection limit reported next to UWN), spiked sample recovery and post digestion spike not within control limits

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A16

METALS SUMMARY - BERYLLIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Beryllium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<5.0	NA	<5.0
PZ-02	Influent System Well	NA	<5.0	NA	<5.0
MW-45	Shallow Well	0.41 B	<5.0	0.83 B	<5.0
MW-46	Intermediate Well	0.56 B	<5.0	1.10 B	<5.0
MW-47	Deep Well	0.3 U	<5.0	0.54 B	<5.0
MW-48	Shallow Well	0.3 U	<5.0	0.54 B	<5.0
MW-49	Deep Well	0.3 U	<5.0	0.2 U	<5.0
MW-50	Intermediate Well	0.3 U	<5.0	0.2 U	<5.0
MW-51	Intermediate Well	0.3 U	<5.0	0.2 U	<5.0
MW-52	Shallow Well	0.3 U	<5.0	0.84 B	<5.0
MW-53	Deep Well	0.3 U	NA ⁽¹⁾	0.84 B	<5.0
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<5.0

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract required reporting limit

U Concentration below detection limit (detection limit reported next to U)

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A17

METALS SUMMARY - BARIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Barium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<200	NA	<200
PZ-02	Influent System Well	NA	<200	NA	<200
MW-45	Shallow Well	81.7 BE	<200	75.6 B	<200
MW-46	Intermediate Well	50.3 BE	<200	61.1 B	<200
MW-47	Deep Well	56.2 BE	<200	43.8 B	<200
MW-48	Shallow Well	75.2 BE	<200	60.7 B	<200
MW-49	Deep Well	53.1 BE	<200	40.6 B	<200
MW-50	Intermediate Well	49.3 B	<200	43.8 B	<200
MW-51	Intermediate Well	59.6 BE	<200	41.9 B	<200
MW-52	Shallow Well	96.0 BE	<200	80.4 B	<200
MW-53	Deep Well	58.0 BE	NA ⁽¹⁾	80.4 B	<200
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<200

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

BE Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit and value estimated due to interference

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A18

METALS SUMMARY - CADMIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Cadmium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<5.0	NA	<5.0
PZ-02	Influent System Well	NA	<5.0	NA	<5.0
MW-45	Shallow Well	2.5 U	<5.0	4.4 B	<5.0
MW-46	Intermediate Well	3.6 B	<5.0	4.4 B	<5.0
MW-47	Deep Well	2.5 U	<5.0	3.8 U	<5.0
MW-48	Shallow Well	4.7 U	<5.0	3.8 U	<5.0
MW-49	Deep Well	4.0 B	<5.0	3.8 U	<5.0
MW-50	Intermediate Well	2.5 U	<5.0	3.8 U	<5.0
MW-51	Intermediate Well	3.6 B	<5.0	4.7 B	<5.0
MW-52	Shallow Well	3.0 B	<5.0	6.4	<5.0
MW-53	Deep Well	2.6 B	NA ⁽¹⁾	6.4	<5.0
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<5.0

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

U Concentration below detection limit (detection limit reported next to U)

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A19

METALS SUMMARY - CALCIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Calcium (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	500	NA	315
PZ-02	Influent System Well	NA	500	NA	446
MW-45	Shallow Well	199 E	220	213	5
MW-46	Intermediate Well	270 E	330	402	379
MW-47	Deep Well	422 E	510	401	453
MW-48	Shallow Well	292 E	340	306	306
MW-49	Deep Well	319 E	390	362	359
MW-50	Intermediate Well	321 E	410	349	337
MW-51	Intermediate Well	336 E	410	390	379
MW-52	Shallow Well	273 E	320	298	293
MW-53	Deep Well	423 E	NA ⁽¹⁾	298	494
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	336

Notes:

mg/L Milligrams per liter

NA Not analyzed

E Value estimated due to interference

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A20

METALS SUMMARY - CHROMIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Chromium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<10	NA	<10
PZ-02	Influent System Well	NA	<10	NA	<10
MW-45	Shallow Well	2.8 U	<10	2.4 U	<10
MW-46	Intermediate Well	2.8 U	<10	2.4 U	<10
MW-47	Deep Well	2.8 U	<10	2.4 U	<10
MW-48	Shallow Well	4.2 BN	<10	2.4 U	<10
MW-49	Deep Well	5.2 BN	<10	2.4 U	<10
MW-50	Intermediate Well	7.9 B	<10	2.4 U	<10
MW-51	Intermediate Well	6.5 B	<10	2.4 U	<10
MW-52	Shallow Well	5.4 B	<10	2.4 U	<10
MW-53	Deep Well	10.2 BN	NA ⁽¹⁾	2.4 U	<10
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<10

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

U Concentration below detection limit (detection limit reported next to U)

BN Value is less than the instrument detection limit, but greater than or equal to the contract required reporting limit, spiked sample recovery not within control limits

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A21

METALS SUMMARY - COBALT
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Cobalt (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<50	NA	<50
PZ-02	Influent System Well	NA	<50	NA	<50
MW-45	Shallow Well	24.2 BN	<50	46.0 B	<50
MW-46	Intermediate Well	11.7 BN	<50	14.2 B	<50
MW-47	Deep Well	10.9 BN	<50	6.0 B	<50
MW-48	Shallow Well	10.9 BN	<50	14.2 B	<50
MW-49	Deep Well	3.9 BN	<50	6.9 B	<50
MW-50	Intermediate Well	3.8 UN	<50	5.6 B	<50
MW-51	Intermediate Well	3.8 UN	<50	7.5 B	<50
MW-52	Shallow Well	5.4 BN	<50	5.4 B	<50
MW-53	Deep Well	12.4 BN	NA ⁽¹⁾	2.4 U	<50
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<50

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

BN Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, spiked sample recovery not within control limits

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

UN Concentration below detection limit (detection limit reported next to UN) and spiked sample recovery not within control limits

U Concentration below detection limit (detection limit reported next to U)

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A22

METALS SUMMARY - COPPER
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Copper (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<25	NA	<25
PZ-02	Influent System Well	NA	<25	NA	<25
MW-45	Shallow Well	2.5 B	<25	2.2 B	<25
MW-46	Intermediate Well	7.3 B	<25	0.8 U	<25
MW-47	Deep Well	1.7 U	<25	0.8 U	<25
MW-48	Shallow Well	9.8 B	<25	0.8 U	<25
MW-49	Deep Well	11.2 B	<25	1.0 B	<25
MW-50	Intermediate Well	6.7 B	<25	1.7 B	<25
MW-51	Intermediate Well	12.8 B	<25	0.8 U	<25
MW-52	Shallow Well	6.5 B	<25	3.0 B	<25
MW-53	Deep Well	1.7 U	NA ⁽¹⁾	3.0 B	<25
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<25

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

U Concentration below detection limit (detection limit reported next to U)

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A23

METALS SUMMARY - IRON
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Iron (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<100	NA	<100
PZ-02	Influent System Well	NA	<100	NA	1060
MW-45	Shallow Well	91.6 B EN	<100	129 E	<100
MW-46	Intermediate Well	153 EN	<100	183 E	<100
MW-47	Deep Well	248 EN	180	527 E	458
MW-48	Shallow Well	122 EN	<100	173 E	<100
MW-49	Deep Well	147 EN	<100	178 E	<100
MW-50	Intermediate Well	149 EN	<100	196 E	<100
MW-51	Intermediate Well	143 EN	<100	220 E	<100
MW-52	Shallow Well	115 EN	<100	145 E	<100
MW-53	Deep Well	1120 EN	NA ⁽¹⁾	145 E	877
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	407

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

EN Value estimated due to interference, and spiked sample recovery not within control limits

E Value estimated due to interference

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A24

METALS SUMMARY - LEAD
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Lead (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<30	NA	<60
PZ-02	Influent System Well	NA	<30	NA	<60
MW-45	Shallow Well	1.0 BWN	<30	1.0 UWN	<60
MW-46	Intermediate Well	1.6 BWN	<30	5.0 UWN	<60
MW-47	Deep Well	5.0 UWN	<30	5.0 UWN	<60
MW-48	Shallow Well	1.6 BW	<30	5.0 UWN	<60
MW-49	Deep Well	1.7 BW	<30	5.0 UWN	<60
MW-50	Intermediate Well	2.6 BWN	<30	5.0 UWN	<60
MW-51	Intermediate Well	1.4 BWN	<30	5.0 UWN	<60
MW-52	Shallow Well	1.0 B	<30	1.0 UWN	<60
MW-53	Deep Well	2.6 BW	NA ⁽¹⁾	1.0 UWN	<60
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<60

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

BWN Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, post digestion spike and spiked sample recovery not within control limits

UWN Concentration below detection limit (detection limit reported next to UW), spiked sample recovery and post digestion spike not within control limits

BW Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, post digestion spike out of control limits

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A25

METALS SUMMARY - MAGNESIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Magnesium (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	1100	NA	644
PZ-02	In fluent System Well	NA	1000	NA	1080
MW-45	Shallow Well	453	450	522	445
MW-46	Intermediate Well	829	890	1040	1030
MW-47	Deep Well	939	1100	1020	1140
MW-48	Shallow Well	756	800	835	905
MW-49	Deep Well	1010	1000	1040	1080
MW-50	Intermediate Well	983	1100	1010	993
MW-51	Intermediate Well	932	990	1000	1020
MW-52	Shallow Well	630	650	709	632
MW-53	Deep Well	1020	NA ⁽¹⁾	709	1115
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	917

Notes:

mg/L Milligrams per liter

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A26

METALS SUMMARY - MANGANESE
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Manganese (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	1100	NA	369
PZ-02	Influent System Well	NA	1000	NA	843
MW-45	Shallow Well	750 E	450	822	733
MW-46	Intermediate Well	658 E	890	804	604
MW-47	Deep Well	981 E	1100	933	1030
MW-48	Shallow Well	1440 E	800	2420	2300
MW-49	Deep Well	444 E	1000	562	526
MW-50	Intermediate Well	977 E	1100	1180	1090
MW-51	Intermediate Well	1020 EN	990	1460	1310
MW-52	Shallow Well	377 E	650	485	492
MW-53	Deep Well	795 E	NA ⁽¹⁾	485	895
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	989

Notes:

mg/L Milligrams per liter

NA Not analyzed

E Value estimated due to interference

EN Value estimated due to interference, and spiked sample recovery not within control limits

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A27

METALS SUMMARY - MERCURY
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Mercury (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<0.20	NA	<0.20
PZ-02	Influent System Well	NA	<0.20	NA	<0.20
MW-45	Shallow Well	0.1 U	<0.20	0.1 U	<0.20
MW-46	Intermediate Well	0.1 U	<0.20	0.1 U	<0.20
MW-47	Deep Well	0.1 U	<0.20	0.1 U	<0.20
MW-48	Shallow Well	0.1 U	<0.20	0.1 U	<0.20
MW-49	Deep Well	0.1 U	<0.20	0.1 U	<0.20
MW-50	Intermediate Well	0.1 U	<0.20	0.1 U	<0.20
MW-51	Intermediate Well	0.1 U	<0.20	0.1 U	<0.20
MW-52	Shallow Well	0.1 U	<0.20	0.1 U	<0.20
MW-53	Deep Well	0.1 U	NA ⁽¹⁾	0.1 U	<0.20
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<0.20

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

U Concentration below method detection limit (detection limit reported next to U)

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A28

METALS SUMMARY - NICKEL
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Nickel (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<40	NA	<40
PZ-02	Influent System Well	NA	<40	NA	<40
MW-45	Shallow Well	14 UN	<40	8.3 U	<40
MW-46	Intermediate Well	14 UN	<40	8.3 U	<40
MW-47	Deep Well	14 UN	<40	8.3 U	<40
MW-48	Shallow Well	14 UN	<40	16.9 B	<40
MW-49	Deep Well	14 UN	<40	12.3 B	<40
MW-50	Intermediate Well	14 UN	<40	8.3 U	<40
MW-51	Intermediate Well	14 UN	<40	24.5 B	<40
MW-52	Shallow Well	14 UN	<40	8.3 U	<40
MW-53	Deep Well	14 UN	NA ⁽¹⁾	8.3 U	<40
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<40

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

UN Concentration below method detection limit (detection limit reported next to UN), and spiked sample recovery not within control limits

U Concentration below method detection limit (detection limit reported next to U)

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A29

METALS SUMMARY - POTASSIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Potassium (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	410	NA	242
PZ-02	Influent System Well	NA	410	NA	307
MW-45	Shallow Well	189	210	194	174
MW-46	Intermediate Well	342	370	293	299
MW-47	Deep Well	361	420	344	340
MW-48	Shallow Well	235	290	248	260
MW-49	Deep Well	300	400	321	311
MW-50	Intermediate Well	328	460	333	317
MW-51	Intermediate Well	316	410	328	306
MW-52	Shallow Well	207	290	239	223
MW-53	Deep Well	299	NA ⁽¹⁾	239	333
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	278

Notes:

mg/L Milligrams per liter

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A30

METALS SUMMARY - SELENIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Selenium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<50	NA	<100
PZ-02	Influent System Well	NA	<50	NA	<100
MW-45	Shallow Well	10 UN	<50	10 UWN	<100
MW-46	Intermediate Well	13 BWN	<50	25.8 +N	<100
MW-47	Deep Well	10 UWN	<50	20 UWN	<100
MW-48	Shallow Well	5 UW	<50	10 UWN	<100
MW-49	Deep Well	5 UW	<50	10 UW	<100
MW-50	Intermediate Well	5 UWN	<50	10 UWN	<100
MW-51	Intermediate Well	10 UWN	<50	10 UW	<100
MW-52	Shallow Well	5 UW	<50	17.7 BNS	<100
MW-53	Deep Well	5 UW	NA ⁽¹⁾	17.7 BNS	<100
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<100

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

UN Concentration below method detection limit (detection limit reported next to UN), and spiked sample recovery not within control limits

UWN Concentration below method detection limit (detection limit reported next to UN), and spiked sample recovery and post digestion spike not within control limits

BWN Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, post digestion spike and spiked sample recovery not within control limits

BNS Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, spiked sample recovery not within control limits and reported value determined by Method of Standards additions

UW Concentration below method detection limit (detection limit reported next to UW) and post digestion sample out of control limits

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A31

METALS SUMMARY - SILVER
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Silver (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<10	NA	<10
PZ-02	Influent System Well	NA	<10	NA	<10
MW-45	Shallow Well	2.0 U	<10	1.9 U	<10
MW-46	Intermediate Well	2.0 U	<10	1.9 U	<10
MW-47	Deep Well	2.0 U	<10	1.9 U	<10
MW-48	Shallow Well	2.0 U	<10	1.9 U	<10
MW-49	Deep Well	2.0 U	<10	1.9 U	<10
MW-50	Intermediate Well	2.0 U	<10	1.9 U	<10
MW-51	Intermediate Well	2.0 U	<10	1.9 U	<10
MW-52	Shallow Well	2.0 U	<10	1.9 U	<10
MW-53	Deep Well	2.0 U	NA ⁽¹⁾	1.9 U	<10
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<10

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

U Concentration below method detection limit (detection limit reported next to U)

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A32

METALS SUMMARY - SODIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Sodium (mg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	9700	NA	6480
PZ-02	Influent System Well	NA	9700	NA	8850
MW-45	Shallow Well	5550	5100	5970	4920
MW-46	Intermediate Well	8400	8000	9260	8030
MW-47	Deep Well	9890	9800	9430	9180
MW-48	Shallow Well	7410	7500	7930	7280
MW-49	Deep Well	8370	9200	9020	8420
MW-50	Intermediate Well	8570	9500	8900	7820
MW-51	Intermediate Well	8330	8800	8860	8250
MW-52	Shallow Well	6070	6700	6900	6220
MW-53	Deep Well	8870	NA ⁽¹⁾	6900	10300
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	7850

Notes:

mg/L Milligrams per liter

NA Not analyzed

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A33

METALS SUMMARY -THALLIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Thallium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<100	NA	<200
PZ-02	Influent System Well	NA	<100	NA	<200
MW-45	Shallow Well	5 UWN	<100	5 UWN	<200
MW-46	Intermediate Well	1 UWN	<100	5 UWN	<200
MW-47	Deep Well	5 UWN	<100	5 UWN	<200
MW-48	Shallow Well	5 UWN	<100	5 UWN	<200
MW-49	Deep Well	5 UWN	<100	5 UWN	<200
MW-50	Intermediate Well	8 BWN	<100	5 UWN	<200
MW-51	Intermediate Well	5 UWN	<100	5 UWN	<200
MW-52	Shallow Well	5 UWN	<100	5 UWN	<200
MW-53	Deep Well	5 UWN	NA ⁽¹⁾	5 UWN	<200
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<200

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

BWN Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit, post digestion spike and spiked sample recovery not within control limits

UWN Concentration below detection limit (detection limit reported next to UW), spiked sample recovery and post digestion spike not within control limits

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A34

METALS SUMMARY -VANADIUM
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Vanadium (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<50	NA	133
PZ-02	Influent System Well	NA	<50	NA	163
MW-45	Shallow Well	12.0 B	<50	12.4 B	108
MW-46	Intermediate Well	14.1 B	<50	13.4 B	160
MW-47	Deep Well	14.7 B	<50	11.0 B	163
MW-48	Shallow Well	9.7 B	<50	10.8 B	149
MW-49	Deep Well	6.1 B	<50	14.1 B	164
MW-50	Intermediate Well	8.6 B	<50	11.2 B	156
MW-51	Intermediate Well	8.9 B	<50	13.1 B	161
MW-52	Shallow Well	7.4 B	<50	10.3 B	133
MW-53	Deep Well	5.8 B	NA ⁽¹⁾	10.3 B	162
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	148

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract required detection limit

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

TABLE A35

METALS SUMMARY - ZINC
NoVOCs™ SITE Demonstration
Site 9, NAS North Island, California

Well	Description	Zinc (Fg/L)			
		Bechtel Baseline 2/6-12/98	Tetra Tech Baseline 4/17/98	Bechtel 6/8-15/98	Tetra Tech 2 nd Baseline 9/8/98
PZ-01	Effluent System Well	NA	<20	NA	376
PZ-02	Influent System Well	NA	23	NA	1810
MW-45	Shallow Well	6.3 B	<20	2.8 B	127
MW-46	Intermediate Well	6.7 B	240	439	<20
MW-47	Deep Well	22.8	720	8.4 B	<20
MW-48	Shallow Well	10.6 B	58	11.9 B	<20
MW-49	Deep Well	47.1	100	42.4	29.4
MW-50	Intermediate Well	18.2 B	74	18.5 B	<20
MW-51	Intermediate Well	40.4	79	14.0 B	<20
MW-52	Shallow Well	15.0 B	<20	9.2 B	<20
MW-53	Deep Well	27.2	NA ⁽¹⁾	9.2 B	21.2
MW-54	Fully Penetrating Well	NA	NA ⁽²⁾	NA	<20

Notes:

Fg/L Micrograms per liter

NA Not analyzed

< Less than

B Value is less than the instrument detection limit, but greater than or equal to the contract reporting detection limit.

⁽¹⁾ Monitoring well MW-53 was not sampled because of a malfunctioning bladder pump.

⁽²⁾ Monitoring well MW-54 was not sampled because of the presence of the multi-level diffusion sampler in the well.

Table A36
GROUNDWATER VOC RESULTS ¾ MONITORING WELL (MW-54)
DIFFUSIONAL MULTI-LAYER SAMPLER
NoVOCsä SITE Demonstration
Site 9, NAS North Island, California

Sample Depth (feet bgs)	Units	ANALYTE				
		1,1- Dichloroethene	1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	Vinly Chloride
44.8 ft	µg/L	8700D	6200D	280	ND	3600
46.0 ft	µg/L	7600D	6100D	650	ND	1800
48.0 ft	µg/L	4000	3700D	1600	ND	220
50.2 ft	µg/L	2600	1500	1600	ND	59
52.3 ft	µg/L	470	310	630	ND	55
54.2 ft	µg/L	200	180	290	ND	56
56.3 ft	µg/L	420	340	460	ND	27
58.4 ft	µg/L	1200D	690	780	ND	33
60.5 ft	µg/L	1600D	640	1300D	ND	53
62.6 ft	µg/L	620	420	1800D	3J	52
64.7 ft	µg/L	4300D	42000D	7600D	82	95
66.6 ft	µg/L	5800D	65000D	2800D	50J	110
68.6 ft	µg/L	7400D	76000D	2800D	50J	200
70.8 ft	µg/L	7500D	76000D	2800D	50J	260
72.8 ft	µg/L	7100D	76000D	2900D	52	300
75.0 ft	µg/L	8200D	78000D	3300D	52	320
77.0 ft	µg/L	7500D	74000D	1900D	50J	340
79.0 ft	µg/L	8000D	85000D	3500	40J	350

Notes:

µg/L Microgram per Liter

bgs Below ground surface

D Laboratory qualifier identifies compounds in an analysis at a secondary dilution factor

J Laboratory qualifier indicating the associated numerical value is an estimated quantity

ND Not detected